IN THE CLAIMS:

Please cancel claims 2-9 without prejudice.

Please replace claim 1 with the following amended claim 1:

1. A chain sprocket for roller chain drives, said sprocket having a sprocket center and teeth spaced by seatings for chain rollers, at least some sprocket teeth have flank profiles differing from one another and disposed in an arrangement effective to reduce noise generated by meshing of the chain rollers with the sprocket, the flank profiles selected to maintain a constant spacing between the seatings and the sprocket center.

Please add the following new claims:

10. A sprocket for a chain and sprocket system, the sprocket comprising:

a plurality of teeth disposed about the circumference of the sprocket, the sprocket teeth each having a flank profile; and

at least a first flank profile and at least a second flank profile, the second flank profile being different from the first flank profile, the first and second flank profiles arranged in a pattern effective to reduce noise generated by contact between the chain and the sprocket.

11. A sprocket for a chain and sprocket system according to claim 10, wherein roots each having a root radius r_1 are defined between adjacent teeth for receiving rollers of a chain, the roots having a constant root diameter d_f.

~~12. A sprocket for a chain and sprocket system according~~

to claim 11, wherein the first flank profile is defined by a tooth flank radius r_{e1}, the tooth flank radius r_{e1} varying between a maximum tooth flank radius r_e max and a minimum tooth flank radius r_e min, and the second flank profile is defined by a tooth flank radius r_{e2} different from the tooth flank radius r_{e1}, the tooth flank radius r_{e2} varying between a maximum tooth flank radius r_e max and a minimum tooth flank radius r_e min.

13. A sprocket for a chain and sprocket system according to claim 12, wherein the flank profiles between each pair of adjacent teeth have an angle α between the root radius r_1 and the tooth flank radius, the angle α varying according to the adjacent flank profiles effective to maintain tangency between each tooth flank radius and root radius r_1.

14. A sprocket for a chain and sprocket system according to claim 12, wherein the sprocket comprises teeth having at least a third flank profile, the third flank profile being different from the first and second flank profiles, the first, second, and third flank profiles arranged in a pattern effective to reduce noise generated by contact between the chain and the sprocket.

15. A sprocket for a chain and sprocket system according to claim 14, wherein the third flank profile is defined by a tooth flank radius r_{e3} different from the tooth flank radius r_{e1} and the tooth flank radius r_{e2}, the tooth flank radius r_{e3} varying between a maximum tooth flank radius r_e max and a minimum tooth flank radius r_e min.

16. A sprocket for a chain and sprocket system according to claim 10, wherein the first and second flank profiles are selected so that the sprocket engages the chain at a different pressure angle for teeth having the first flank profile than for teeth having the second flank profile.

17. A sprocket for a chain and sprocket system according to claim 10, wherein the sprocket has a constant outer diameter d_a.

18. A sprocket for a chain and sprocket system according to claim 10, wherein the first and second flank profiles are selected to maintain a constant chordal pitch between adjacent teeth.

19. A sprocket for a chain and sprocket system according to claim 10, wherein each tooth has a first side and a second side, the first and second sides for each respective tooth having an identical tooth flank radius r_e.

20. A method of making a sprocket for a chain and sprocket system, the method comprising:

defining a plurality of teeth disposed about the circumference of the sprocket, the sprocket teeth each having a flank profile;

providing at least a first flank profile and at least a second flank profile, the second flank profile being different from the first flank profile; and

arranging the first and second flank profiles in a pattern effective to reduce noise generated by contact between the chain and the sprocket.

21. A method of making a sprocket according to claim 20, including providing roots between adjacent teeth for receiving rollers of a chain, each root having a radius r_1 and the roots having a constant root diameter d_f.

22. A method of making a sprocket according to claim 21, including defining the first flank profile by a tooth flank radius r_{e1}, the tooth flank radius r_{e1} varying between a maximum tooth flank radius r_e max and a minimum tooth flank radius r_e

min, and defining the second flank profile a tooth flank radius r_{e2} different from the tooth flank radius r_{e1}, the tooth flank radius r_{e2} varying between a maximum tooth flank radius r_e max and a minimum tooth flank radius r_e min.

23. A method of making a sprocket according to claim 22, including providing the flank profiles between each pair of adjacent teeth with an angle α between the root radius r_1 and the tooth flank radius and varying the angle α according to the adjacent flank profiles effective to maintain tangency between each tooth flank radius and root radius r_1.

24. A method of making a sprocket according to claim 22, including providing the sprocket with teeth having at least a third flank profile, the third flank profile being different from the first and second flank profiles, the first, second, and third flank profiles arranged in a pattern effective to reduce noise generated by contact between the chain and the sprocket.

25. A method of making a sprocket according to claim 24, including defining the third flank profile by a tooth flank radius r_{e3} different from the tooth flank radius r_{e1} and the tooth flank radius r_{e2}, the tooth flank radius r_{e3} varying between a maximum tooth flank radius r_e max and a minimum tooth flank radius r_e min.

26. A method of making a sprocket according to claim 20, including selecting the first and second flank profiles so that the sprocket engages the chain at a different pressure angle for teeth having the first flank profile than for teeth having the second flank profile.

27. A method of making a sprocket according to claim 20, including configuring the sprocket to have a constant

outer diameter d_a.

28. A method of making a sprocket according to claim 20, including selecting the first and second flank profiles to maintain a constant chordal pitch between adjacent teeth.

29. A method of making a sprocket according to claim 20, including providing each tooth with a first side and a second side and configuring the flank profile for each respective tooth to have an identical tooth flank radius r_e on the first side and the second side.

30. A sprocket for a chain and sprocket system, the sprocket comprising:

a plurality of teeth disposed about the circumference of the sprocket, the sprocket teeth each having a flank profile;

at least a first flank profile and at least a second flank profile, the second flank profile being different from the first flank profile; and

means for arranging the first and second flank profiles to reduce noise generated by contact between the chain and the sprocket.

31. A sprocket for a chain and sprocket system, the sprocket comprising:

a plurality of teeth disposed about the circumference of the sprocket, the sprocket teeth each having a flank profile; and

at least a first flank profile, at least a second flank profile, and at least a third flank profile, the first flank profile being different from the second and third flank profiles and the second flank profile being different from the third flank profile, the first, second, and third flank profiles arranged in a pattern effective to reduce noise generated by contact between the chain and the sprocket.

32. A sprocket for a roller chain and sprocket system, the sprocket comprising:

a plurality of teeth disposed about the circumference of the sprocket, the sprocket teeth each having a flank profile with a tooth flank radius r_e, each tooth having first and second sides having an identical tooth flank radius r_e;

roots defined between pairs of adjacent teeth for receiving rollers of the roller chain, each root having a root radius r_1; and

a plurality of different flank profiles each having a different tooth flank radius r_e, the teeth flank radii varying between a maximum tooth flank radius r_e max and a minimum tooth flank radius r_e min, the different flank profiles arranged in a pattern effective to reduce noise generated by contact between the roller chain and the sprocket by varying the pressure angle at which the roller chain contacts the roots while maintaining a constant outer ~~diameter d and a constant addendum circle diameter d_a~~.